Bubbleology

Focus: Physical Science **Grades K-4**

Background:

Bubbleology is the study of surface tension. Surface tension is created in a liquid when very cold (magnetic) molecules are attached to a surface and to each other. This is a condition that takes place at the free surface of a liquid, gives the surface an elastic quality and causes tension. Tension begins when the molecules move inward and become unbalanced. This is reflected in the curvature of the molecule which forms a bubble. It is caused by the reaction of cohesiveness of the molecules and the contact of the liquid with the surface itself.

Objectives:

- ✓ Students will be able to identify the chemical makeup of water molecules.
- ✓ Students will be able to identify the chemical makeup of soap molecules.
- ✓ Students will be able to identify a physical change in water.
- ✓ Students will be able to understand the difference between physical and chemical reactions.
- ✓ Students will be able to describe in their own words why surface tension occurs.
- ✓ Students will be able to speculate which liquid would have the highest surface tension and make the best bubbles.

Learning outcomes:

Learning outcomes for this lesson are based on the 4th grade Ohio proficiency test standards.

- ✓ Select instruments, make observations and/or organize observations of an event, object or organism.
- ✓ Identify and/or compare the mass, dimensions and volume of familiar object in standard and/ or non-standard units.
- ✓ Analyze a series of events and/or simple daily or seasonal cycles and predict the next likely occurrence in the sequence.
- ✓ Evaluate a simple procedure to carry out an exploration.
- ✓ Identify and/or discuss the selection of resources and tools used for exploring scientific phenomena.
- ✓ Demonstrate an understanding of safe use of materials and/or devices in science activities.
- ✓ Identify characteristics of a simple physical change.

Bubbleology Cont.

Lesson #1: Overview

- ✓ Identify a molecule.
- ✓ Discuss molecules in a liquid form.
- ✓ How and why molecule form is round.
- ✓ What makes molecules move?
- ✓ Who is Wally?
- ✓ Who is Sophie?

Activity

1. Explain that a molecule is made up of 2 hydrogen and 1 oxygen atom.
2. Place a drop of water on a piece of wax paper; notice the shape and explain the reason that the droplet is round. It is spherical because the water molecules stay together reattaching themselves to one another.
3. Introduce Wally the water molecule.
4. Try to separate the droplet and chart the data.
5. Explain what would happen if you add a chemical to the water.
6. Discuss what would happen if you add soap to the water.
7. Introduce Sophie the soap molecule.
8. Add soap to the water and see what happens to the water.
9. Now that you have the soap and water mix, discuss bubbles.
10. Discuss the shapes.
11. Give the students different shaped objects and let them explore.